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WEBINAR (August 4 2020, 9:30-11:30am)
Grape Harvest Workshop 2020

Organization:
Patti Friszolowski
NC Winegrower Association

Host:
Mark Hoffmann
NC State University

Panelists:
Michael Jones, Scott Labs
Megan Hereford, Scott Labs
Mark Hoffmann, Small Fruits Extension Specialist, NC State University
David Bower, Enology Instructor, Surry Community College

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Agenda

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- Review of protocols associated with yeast rehydration and preparation for juice inoculation. *Michael Jones, Scott Labs*
- Discussion on the required juice nutrient level to ensure healthy and clean fermentation. *Megan Hereford, Scott Labs*
- Expectations and crop level for the 2020 Harvest season *Mark Hoffmann, NC State*
- Prepare your lab for harvest. *David Bower, Surry Community College*

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Rules

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Q+A:
- Please write your questions into the Q+A box
- *We try to address all questions during and after a presentation. There will be enough time for Q+As after each presentation.*
- Mark and Patti will monitor questions and will make sure that we won't miss any.

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Online

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Webinar recording will be available on the Grape Portal:
https://grapes.ces.ncsu.edu

Enjoy the webinar ☺

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Harvest in 2020: Estimates and Strategies

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Why is it important?

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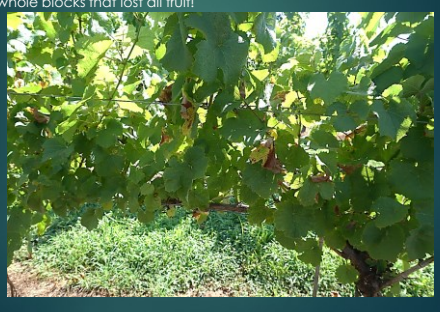
After the frost, we have various situations, often in the same vineyard:
Vines or whole blocks that lost all fruit!



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Why is it important?

7

After the frost, we have various situations, often in the same vineyard:
Vines and blocks with primary and secondary clusters, un-even ripening

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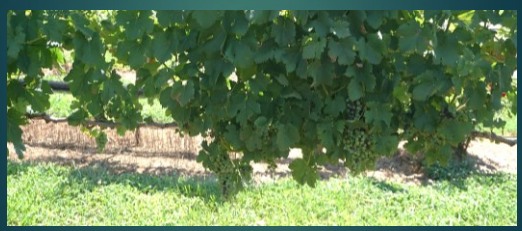
Why is it important?

8

After the frost, we have various situations, often in the same vineyard:
Vines with less and smaller clusters per vine than in a 'normal' year



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Why is it important?

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After the frost, we have various situations, often in the same vineyard:
Vines might have even ripening, but highly variable number of clusters in a block

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Weather Changes

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Year	April		May	
	Days below 41 °F	Days above 0.15 in.	Days below 41 °F	Days above 0.15 in.
2005	4	0	1	0
2006	3	0	0	0
2007	5*	0	0	0
2008	4	0	0	0
2009	2	0	0	0
2010	3	0	0	0
2011	2	0	0	0
2012	5	0	0	0
2013	7	0	1	0
2014	4	4	0	2
2015	2	5	0	4
2016	6	6	0	8
2017	1	4	0	9
2018	6	6	0	10
2019	3	8	0	3
2020	5	10	2	8

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What are the main problems?

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- Primary and secondary clusters
- Uneven ripening
- Uneven cluster/vine distribution
- Estimated cluster weights might be off

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Crop Estimate Methods

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Big questions in 2020:

- What do I harvest?
- How do I assess a representative number of clusters/vine for one block?
- Will the clusters we harvest this year have similar weights to last year?

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Ripening

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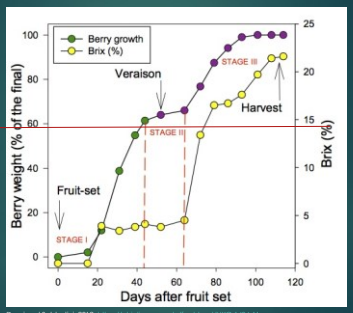

Dami and Sabbatini, 2012. https://ohioline.osu.edu/factsheet/hyg-1434-11

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Crop Estimate Methods

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- Harvest Cluster Weight Method (HCW)
- Lag-Phase Method

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Crop Estimate Methods

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HCW and Lag-Phase

- Number of bearing and non-bearing vines per acre
- Number of clusters per vine

Difference:

- *Lag-phase: Cluster weight THIS season*
- *HCW: Based on cluster weights from LAST seasons.*

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Harvest Cluster Weight

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Predicted Yield (tons per acre) = (#Vines x #Clusters/vine x Multi-year Cluster Weight (lbs)) / 2000

- For each cultivar
- This year: Uniformity of age and vine size. Smaller blocks, based on uniformity of damage/loss

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Crop Estimate Methods

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If ripening is uneven

- Harvest or not harvest? Only count the clusters you will harvest!

If ripening is delayed

- Harvest could be delayed (late cultivars could go into late October this year)
- Wine-style decisions?

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Number of vines

18

Non-bearing

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Number of vines

19

Non-bearing

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Number of vines

20

Bearing? Low-cluster count

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Number of vines

21

Only count clusters that will be harvested

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Number of vines

22

Make an overall assessment which clusters will be harvested

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Number of vines

23

- Number of vines per acre:

Row/Vine	4ft	5ft	6ft
9ft	1210	968	807
10ft	1098	871	726
11ft	990	792	660

- Count all dead/diseased vines
- **Additionally count all vines that are not being harvested or not bearing!**
- 726 vines/acre. 5% are dead, 25% are non-bearing or won't be harvested: **508 bearing vines**

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Number of Clusters

24

Real world example: 'Merlot', Research plot, grower estimated 75% crop loss to a normal year.

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Number of Clusters

25

Real world example: 'Merlot', Research plot, uninform age and uniform size; Grower estimated 75% crop loss to a normal year, even ripening

VSP, block was pruned to 2 buds per spur, and shoot thinned to 12 shoots per vine (24 buds per vine).

Row1	Row2	Row3	Row4	Row5
2	5	4	8	2
10	5	4	9	11
5	12	4	13	2
16	11	13	11	5
12	7	6	8	9
7	4	10	3	12
9	7	1	15	13
1	3	5	2	14
14	5	8	10	11
3	5	8	14	12
6	2	6	15	14
10	5	8	4	5
14	17	14	5	7
11	14	12	7	4
8	6	7	3	10

Average 2020: **8 clusters/vine**
Multi-year average: **29 clusters/vine**
= 73% crop loss

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Number of Clusters

26

Row1	Row2	Row3	Row4	Row5
2	5	4	8	2
10	5	4	9	11
5	12	4	13	2
16	11	13	11	5
12	7	6	8	9
7	4	10	3	12
9	7	1	15	13
1	3	5	2	14
14	5	8	10	11
3	5	8	14	12
6	2	6	15	14
10	5	8	4	5
14	17	14	5	7
11	14	12	7	4
8	6	7	3	10

Scenario 1: 20% of the field in blocks (high cluster)

10 clusters/vine

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Number of Clusters

27

Row1	Row2	Row3	Row4	Row5
2	5	4	8	2
10	5	4	9	11
5	12	4	13	2
16	11	13	11	5
12	7	6	8	9
7	4	10	3	12
9	7	1	15	13
1	3	5	2	14
14	5	8	10	11
3	5	8	14	12
6	2	6	15	14
10	5	8	4	5
14	17	14	5	7
11	14	12	7	4
8	6	7	3	10

Scenario 2: 20% of the field in blocks (low cluster)

5 clusters/vine

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Number of Clusters

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Row1	Row2	Row3	Row4	Row5
2	5	4	8	2
10	5	4	9	11
5	12	4	13	2
16	11	13	11	5
12	7	6	8	9
7	4	10	3	12
9	7	1	15	13
1	3	5	2	14
14	5	8	10	11
3	5	8	14	12
6	2	6	15	14
10	5	8	4	5
14	17	14	5	7
11	14	12	7	4
8	6	7	3	10

Scenario 3: 20% of the field in blocks (low + high cluster)

7.6 clusters/vine

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Number of Clusters

29

Real world example: 'Merlot', Research plot, uninform age and uniform size; Grower estimated 75% crop loss to a normal year, even ripening

Row1	Row2	Row3	Row4	Row5
2	5	4	8	2
10	5	4	9	11
5	12	4	13	2
16	11	13	11	5
12	7	6	8	9
7	4	10	3	12
9	7	1	15	13
1	3	5	2	14
14	5	8	10	11
3	5	8	14	12
6	2	6	15	14
10	5	8	4	5
14	17	14	5	7
11	14	12	7	4
8	6	7	3	10

Scenario 4: 5% of the field (low + high) clusters

8.25 clusters/vine

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Number of Clusters

30

Real world example: 'Merlot', Research plot, uninform age and uniform size; Grower estimated 75% crop loss to a normal year, even ripening

Row1	Row2	Row3	Row4	Row5
2	5	4	8	2
10	5	4	9	11
5	12	4	13	2
16	11	13	11	5
12	7	6	8	9
7	4	10	3	12
9	7	1	15	13
1	3	5	2	14
14	5	8	10	11
3	5	8	14	12
6	2	6	15	14
10	5	8	4	5
14	17	14	5	7
11	14	12	7	4
8	6	7	3	10

Scenario 5: 5% of the field (low + high) clusters

9.5 clusters/vine

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Number of Clusters

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- This year every block can be different, even in the same cultivar
- *Create meaningful blocks, that reflect a similar pattern at the majority of the vines*
- In those blocks, you can assess Number of Clusters by assessing equally the whole bandwidth of cluster bearing vines (the more vines, the more accurate; We recommend more than the usual 4-5%)

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HCW: Cluster Weights

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Cluster Weights:
The most variable parameter in crop estimation, highly influenced by weather.

- *Use long-term average for this cultivar*
- *In our case: 0.4 lbs/cluster*

- ***508 bearing vines***
- ***8 clusters/vine***
- ***0.4 lbs/cluster***

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Harvest Cluster Weight

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Predicted Yield (tons per acre) =
(#Vines x #Clusters/vine x Cluster Weight (lbs)) / 2000

Predicted Yield (tons per acre) =
(508 vines x 8 clusters/vine x 0.4lbs) / 2000
= 0.81 tons per acre

Predicted Yield (tons per acre) =
(690 vines x 29 clusters/vine x 0.4lbs) / 2000
= 4 tons per acre = estimated 80% loss

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Lag-phase determination

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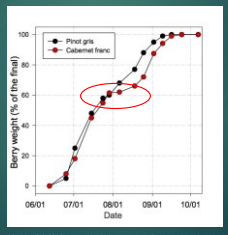
Predicted Yield (tons per acre) =
(#Vines x #Clusters/vine x **Cluster Weight** (lbs)) / 2000



Dami and Sabbatini, 2012: https://ohioline.osu.edu/factsheet/HYG-1434-11

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Lag-phase determination not trivial

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- Lag-phase (*L*) describes the period in which there is little increase in mass/volume of a berry
- It is the asymptotic deceleration of berry growth, separating the initial phase of rapid growth after anthesis and the second phase of fruit maturation.

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Lag-phase determination not trivial

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- Sample fruit before second period of growth starts
- Green berries at the cusp of softening
- Seeds are hardening (test with knife)
- **Not all berries on a cluster ripe at the same time!!!**
- If you have reached *L* phase: harvest representative number of clusters and weigh the cluster (lot of labor)

- Example: Clusters at *L* phase were 0.16 lbs

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Lag-phase determination not trivial

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- Example: Clusters at *L* phase were 0.18 lbs
- Estimated Cluster Weight: 0.18 lbs * 2 = 0.36 lbs

Predicted Yield (tons per acre) =
(508 vines x 8 clusters/vine x 0.36lbs) / 2000
= 0.73 tons per acre

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Results

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- HCW method: 0.81 tons/acre were estimated
- *L* phase: 0.73 tons/acre were estimated

- HCW depends on history of accurate yield data
- *L* phase depends on experience and labor availabiltiy

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Conclusions

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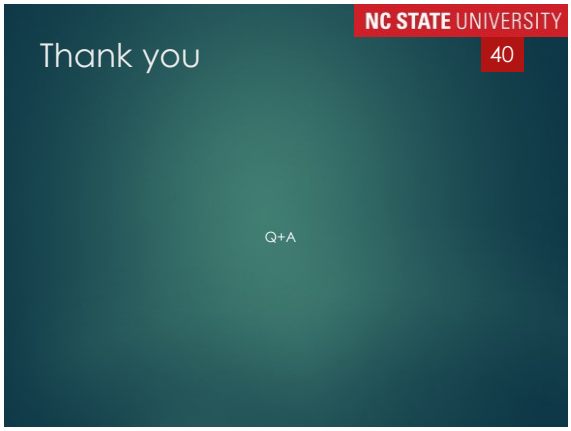
- Divide your vineyard in meaningful blocks, by cultivar and observed fruiting habit
- Subtract the number vines that won't be harvested from your total vine counts
- Increase number of vines that you will count for clusters.
- Include high and low cluster count vines
- Expect to be more off with your estimates than in a usual year.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40
Thank you
Q+A